

CLAIMS

What is claimed:

1. A method for removing unconsolidated material from a substrate having at least one programmable material consolidation-fabricated feature thereon, comprising:
directing pressure towards the unconsolidated material.
2. The method of claim 1, wherein directing comprises directing a positive pressure.
3. The method of claim 2, wherein directing the positive pressure comprises directing a positive pressure sufficient to reduce adhesion of the unconsolidated material to at least one of the substrate and the at least one programmable material consolidation-fabricated feature.
4. The method of claim 2, wherein directing the positive pressure comprises directing a positive pressure sufficient to substantially remove the unconsolidated material from at least one of the substrate and the at least one programmable material consolidation-fabricated feature.
5. The method of claim 1, wherein directing comprises directing a negative pressure.
6. The method of claim 5, wherein directing the negative pressure comprises directing a negative pressure sufficient to reduce adhesion of the unconsolidated material to at least one of the substrate and the at least one programmable material consolidation-fabricated feature.
7. The method of claim 5, wherein directing the negative pressure comprises directing a negative pressure sufficient to substantially remove the unconsolidated material from

at least one of the substrate and the at least one programmable material consolidation-fabricated feature.

8. The method of claim 5, further comprising:
collecting unconsolidated material removed from at least one of the substrate and the at least one programmable material consolidation-fabricated feature.

9. The method of claim 8, further comprising:
returning the unconsolidated material to a quantity of unconsolidated material to be used for subsequent programmable material consolidation fabrication.

10. The method of claim 9, further comprising:
filtering the unconsolidated material following the collecting and before or during returning the unconsolidated material.

11. The method of claim 1, further comprising:
cleaning residual unconsolidated material from at least one of the substrate and the at least one programmable material consolidation-fabricated feature.

12. The method of claim 11, wherein cleaning comprises applying at least one cleaning agent onto at least one of the substrate and the at least one programmable material consolidation-fabricated feature.

13. The method of claim 12, wherein applying comprises directing at least one cleaning agent onto at least one of the substrate and the at least one programmable material consolidation-fabricated feature.

14. The method of claim 13, wherein directing comprises spraying the at least one cleaning agent onto at least one of the substrate and the at least one programmable material consolidation-fabricated feature.

15. The method of claim 12, wherein applying comprises at least partially immersing the substrate in a quantity of the at least one cleaning agent.

16. The method of claim 15, wherein cleaning further comprises agitating at least one of the substrate and the at least one cleaning agent.

17. The method of claim 12, further comprising:
removing the at least one cleaning agent from at least one of the substrate and the at least one programmable material consolidation-fabricated feature.

18. The method of claim 17, wherein removing comprises applying pressure to the unconsolidated material.

19. The method of claim 18, wherein applying pressure comprises applying positive air pressure.

20. The method of claim 18, wherein applying pressure comprises applying negative air pressure.

21. The method of claim 17, wherein removing comprises applying force to the unconsolidated material.

22. The method of claim 21, wherein applying force comprises applying a centrifugal force.

23. A method for removing unconsolidated material from a substrate having at least one programmable material consolidation-fabricated feature thereon, comprising:
applying force to the unconsolidated material.

24. The method of claim 23, wherein applying force comprises applying a centrifugal force to the unconsolidated material.

25. The method of claim 24, wherein applying centrifugal force comprises spinning the substrate.

26. The method of claim 23, wherein applying force comprises applying force sufficient to reduce adhesion of the unconsolidated material to at least one of the substrate and the at least one programmable material consolidation-fabricated feature.

27. The method of claim 23, wherein applying force comprises applying force sufficient to substantially remove the unconsolidated material from at least one of the substrate and the at least one programmable material consolidation-fabricated feature.

28. The method of claim 23, further comprising:
collecting unconsolidated material removed from at least one of the substrate and the at least one programmable material consolidation-fabricated feature.

29. The method of claim 28, further comprising:
returning the unconsolidated material to a quantity of unconsolidated material to be used for subsequent programmable material consolidation fabrication.

30. The method of claim 29, further comprising:
filtering the unconsolidated material following collecting and before or during returning the unconsolidated material.

31. The method of claim 23, further comprising:
cleaning residual unconsolidated material from at least one of the substrate and the at least one programmable material consolidation-fabricated feature.

32. The method of claim 31, wherein cleaning comprises applying at least one cleaning agent onto at least one of the substrate and the at least one programmable material consolidation-fabricated feature.

33. The method of claim 32, wherein applying comprises directing at least one cleaning agent onto at least one of the substrate and the at least one programmable material consolidation-fabricated feature.

34. The method of claim 33, wherein directing comprises spraying the at least one cleaning agent onto at least one of the substrate and the at least one programmable material consolidation-fabricated feature.

35. The method of claim 32, wherein applying comprises at least partially immersing the substrate in a quantity of the at least one cleaning agent.

36. The method of claim 35, wherein cleaning further comprises agitating at least one of the substrate and the at least one cleaning agent.

37. The method of claim 32, further comprising:
removing the at least one cleaning agent from at least one of the substrate and the at least one programmable material consolidation-fabricated feature.

38. The method of claim 37, wherein removing comprises applying pressure to the unconsolidated material.

39. The method of claim 38, wherein applying pressure comprises applying positive air pressure.

40. The method of claim 38, wherein applying pressure comprises applying negative air pressure.

41. The method of claim 37, wherein removing comprises applying force to the unconsolidated material.

42. The method of claim 41, wherein applying force comprises applying a centrifugal force.

43. The method of claim 42, wherein applying force to the unconsolidated material is effected a first location over the fabrication site.

44. The method of claim 43, wherein applying centrifugal force is effected at a second elevation over the fabrication site, the second elevation differing from the first elevation.

45. The method of claim 44, further comprising:
preventing introduction of the at least one cleaning agent into the fabrication site.

46. A method for cleaning unconsolidated material from a substrate having at least one programmable material consolidation-fabricated feature thereon, comprising:
applying at least one cleaning agent onto at least one of the substrate and the at least one programmable material consolidation-fabricated feature.

47. The method of claim 46, wherein applying comprises directing at least one cleaning agent onto at least one of the substrate and the at least one programmable material consolidation-fabricated feature.

48. The method of claim 47, wherein directing comprises spraying the at least one cleaning agent onto at least one of the substrate and the at least one programmable material consolidation-fabricated feature.

49. The method of claim 46, wherein applying comprises at least partially immersing the substrate in a quantity of the at least one cleaning agent.

50. The method of claim 49, wherein cleaning further comprises agitating at least one of the substrate and the at least one cleaning agent.

51. The method of claim 46, further comprising:
removing the at least one cleaning agent from at least one of the substrate and the at least one programmable material consolidation-fabricated feature.

52. The method of claim 51, wherein removing comprises applying pressure to the unconsolidated material.

53. The method of claim 52, wherein applying pressure comprises applying positive air pressure.

54. The method of claim 52, wherein applying pressure comprises applying negative air pressure.

55. The method of claim 51, wherein removing comprises applying force to the unconsolidated material.

56. The method of claim 55, wherein applying force comprises applying a centrifugal force.

57. A method for recovering unconsolidated material from a substrate upon which at least one feature has been programmable material consolidation-fabricated, comprising:
collecting the unconsolidated material from the substrate; and
returning the unconsolidated material to at least one of a fabrication site and a reservoir in communication with the fabrication site.

58. The method of claim 57, wherein collecting includes applying a negative pressure to the substrate to remove the unconsolidated material therefrom.

59. The method of claim 57, wherein collecting includes introducing the unconsolidated material into a conduit.

60. The method of claim 59, wherein returning comprises transporting the unconsolidated material along the conduit.

61. The method of claim 60, wherein transporting is effected with at least one pump.

62. The method of claim 60, further comprising:
filtering the unconsolidated material before or during the returning.

63. The method of claim 57, wherein returning comprises applying pressure to the unconsolidated material.

64. The method of claim 63, wherein applying pressure comprise pumping the unconsolidated material.

65. The method of claim 57, further comprising:
filtering the unconsolidated material before or during the returning.